

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of the Claims:

1. (Original) A handling device for use with a medical injector having a cylindrical body provided with a boss at the forward end thereof supporting a forwardly-projecting needle furnished with a protective sheath, which device comprises:

a carrier having an outer cylindrical wall and co-axial therewith an inner tube which is a close sliding fit over the protective sheath of a needle;

a cylindrical sleeve slidably mounted within the outer cylindrical wall of the carrier, the rear end of the sleeve being adapted to receive the cylindrical body of the injector;

a bushing slidably located within the cylindrical sleeve, which bushing is retained within the sleeve and defines a bore for receiving the boss at the forward end of the injector body;

spring means urging the bushing towards the rear end of the sleeve; and

a plug slidably mounted on the carrier and projectable from the forward end thereof, the forward end of the protective sheath of a received injector engaging the plug;

whereby in use the device may be fitted to the forward end of an injector by receiving the injector cylindrical body in the sleeve and the boss in the bore of the bushing, the sheath then coupling to the inner tube of the carrier and the forward end of the sheath engaging the plug and pushing the plug forwardly with respect to the carrier to project therefrom, and on subsequent withdrawal of the carrier from the injector, the bushing and sleeve remain on the injector and the sheath remains within the carrier with the plug projecting from the forward end thereof.

2. (Original) A handling device as claimed in claim 1, wherein the carrier has an inner cylindrical wall connected at the forward end of the carrier to the outer cylindrical wall, the inner tube being connected to the rear end of the inner cylindrical wall.

3. (Original) A handling device as claimed in claim 2, wherein the cylindrical sleeve is slidable within the annular space between the inner and outer cylindrical walls of the carrier.

4. (Original) A handling device as claimed in claim 2 or claim 3, wherein the plug is slidably supported within the inner cylindrical wall of the carrier.

5. (Original) A handling device as claimed in claim 4, wherein the plug is a sufficient light frictional fit within said cylindrical wall to restrain movement of the plug with respect to the carrier under the influence of gravity.

6. (Original) A handling device as claimed in claim 4 or claim 5, wherein the length of the plug is such that the plug may be substantially wholly accommodated within the carrier prior to use of the device with an injector.

7. (Original) A handling device as claimed in any of claims 4 to 6, wherein the plug and the forward end of the inner cylindrical wall co-operate to limit forward movement of the plug, out of the carrier.

8. (Original) A handling device as claimed in any of the preceding claims, wherein the plug has an enlarged head at its forward end which lies externally of the carrier.

9. (Original) A handling device as claimed in any of the preceding claims, wherein the rear end of the sleeve is internally profiled to permit the bushing to be pushed into the sleeve thereafter to retain the bushing within the sleeve.

10. (Original) A handling device as claimed in claim 9, wherein the internal profile of the rear end of the sleeve includes one or more radially-inwardly directed nibs with which the bushing is engageable.

11. (Original) A handling device as claimed in any of the preceding claims, wherein the bushing includes an in-turned lip at the forward end thereof, which lip is engageable by the forward end of the injector boss to define an engaged relative position of the injector and the bushing.

12. (Original) A handling device as claimed in claim 11 when dependent on claim 2, wherein said lip of the bushing engages the rear end of the inner tube when the cylindrical sleeve is fully within the outer cylindrical wall of the carrier.

13. (Original) A handling device as claimed in any of the preceding claims, wherein the plug has a rearwardly-facing socket within which the forward end of the needle sheath of an injector is receivable.

14. (Original) A handling device as claimed in any of the preceding claims, wherein the spring means comprises a helical compression spring located within the sleeve and acting between the forward end of the sleeve and the bushing.

15. (Original) A handling device as claimed in any of the preceding claims, wherein the boss at the forward end of the cylindrical body is externally screw-threaded, for use with a needle having a hub with an internally-threaded socket co-operable with the threads of the boss.

16. (Original) A handling device as claimed in any of the preceding claims when dependent on claim 2, wherein the rear end of the plug locates in an annular space between the inner cylindrical wall of the carrier and the inner tube, when the plug is fully within the carrier.

17. (Original) A handling device as claimed in any of the preceding claims, wherein the plug is of a contrasting color to that of the carrier.

18. (Original) A handling device as claimed in any of the preceding claims, wherein the sleeve defines an elongate internal cavity of a sufficient length to accommodate the body of a pen-style injector intended for self administration, leaving only the plunger of the injector accessible.

19. (Original) The combination of a handling device as claimed in any one of the preceding claims and a medical injector having a cylindrical body provided with a boss at the forward end thereof for supporting a forwardly-projecting needle furnished with a protective a sheath, wherein the boss is receivable in the bore of the bushing, the sleeve is slidable rearwardly over the cylindrical body of the injector, and the sheath is connectable to the inner tube of the carrier.

20. (Original) A method of using a handling device as claimed in any one of claims 1 to 18 with a medical injector having a cylindrical body provided with an externally threaded boss at the forward end thereof for supporting a needle having an internally threaded

hub engageable with the threads of the boss and a needle sheath surrounding and protecting the needle, comprising the steps of:

threading the hub of a needle on to the boss of the injector;

pushing the carrier on to the forward end of the injector so that the injector body is slidably received in the cylindrical sleeve, the boss carrying the needle hub is received in the bore of the bushing, the sheath is coupled to the inner tube, and the sheath engages the plug and pushes the plug forwardly to project from the carrier;

pulling the carrier away from the cylindrical body of the injector with the sheath retained within the inner tube, the sleeve remaining on the injector body and the bushing remaining on the needle hub and boss, with the sleeve being urged forwardly by the spring to protect the needle;

and following the performance of an injection, during which the sleeve slides rearwardly over the injector body against the action of the spring to expose the needle as required:

pushing the carrier once more on to the forward end of the injector so receiving the sleeve into the carrier and refitting the sheath on to the needle;

rotating the carrier to unthread the needle hub from the boss and freeing the carrier from the injector body with the needle and sheath carried therewithin; and

pressing the projecting plug back into the carrier, so driving the sheathed needle out of the handling device.

21. (Original) A handling device for use with a medical injector having a cylindrical body provided with a boss at the forward end thereof supporting a forwardly-projecting needle furnished with a protective sheath, which device comprises:

- a carrier having an outer cylindrical wall and co-axial therewith an inner tube which is a close sliding fit over the protective sheath of a needle;
- a cylindrical sleeve slidably mounted within the outer cylindrical wall of the carrier, the rear end of the sleeve being adapted to receive the cylindrical body of the injector;

— a bushing slidably located within the cylindrical sleeve, which bushing is retained within the sleeve and defines a bore for receiving the boss at the forward end of the injector body; and

— spring means urging the bushing towards the rear end of the sleeve;

whereby in use the device is fitted to the forward end of an injector by receiving the injector cylindrical body in the sleeve and the boss in the bore of the bushing, the sheath then coupling to the inner tube of the carrier to be gripped thereby, and on subsequent withdrawal of the carrier from the injector the bushing and sleeve remain on the injector and the sheath remains within the carrier.

22. (Original) A handling device as claimed in claim 21, wherein the carrier has an inner cylindrical wall connected at the forward end of the carrier to the outer cylindrical wall, the inner tube being connected to the rear end of the inner cylindrical wall.

23. (Original) A handling device as claimed in claim 22, wherein the cylindrical sleeve is slidable within the annular space between the inner and outer cylindrical walls of the carrier.

24. (Original) A handling device as claimed in claim 21, wherein the sleeve has a rear end which is internally profiled to permit the bushing to be pushed into said rear end of the sleeve thereafter to retain the bushing within the sleeve.

25. (Original) A handling device as claimed in claim 24, wherein the rear end of the sleeve has an internal profile which includes one or more radially-inwardly directed nibs with which the bushing is engageable.

26. (Original) A handling device as claimed in claim 21, wherein the bushing includes an in-turned lip at the forward end thereof, which lip is engageable by the forward end of the injector boss to define an engaged relative position of the injector and the bushing.

27. (Original) A handling device as claimed in claim 26, wherein the carrier has an inner cylindrical wall connected at the forward end of the carrier to the outer cylindrical wall, the inner tube is connected to the rear end of the inner cylindrical wall, and said lip of the bushing engages the rear end of the inner tube when the cylindrical sleeve is fully within the outer cylindrical wall of the carrier.

28. (Original) A handling device as claimed in claim 21, wherein the spring means comprises a helical compression spring located within the sleeve and acting between the forward end of the sleeve and the bushing.

29. (Original) A handling device as claimed in claim 21, wherein the boss at the forward end of the cylindrical body is externally screw-threaded, for use with a needle having a hub with an internally-threaded socket co-operable with the threads of the boss.

30. (Original) A handling device as claimed in claim 21, wherein the sleeve defines an elongate internal cavity of a sufficient length to accommodate the body of a pen-style injector having a plunger and intended for self administration, leaving only the plunger of the injector accessible.

31. (Original) The combination of a handling device as claimed in claim 21 and a medical injector having a cylindrical body provided with a boss at the forward end thereof for supporting a forwardly-projecting needle furnished with a protective sheath, wherein the boss is receivable in the bore of the bushing, the sleeve is slidable rearwardly over the cylindrical body of the injector, and the sheath is connectable to the inner tube of the carrier.

32. (Original) A method of using a handling device as claimed in claim 21 with a medical injector having a cylindrical body provided with an externally threaded boss at the forward end thereof for supporting a needle having an internally threaded hub engageable with the threads of the boss and a needle sheath surrounding and protecting the needle, comprising the steps of:

- threading the hub of a needle on to the boss of the injector;
- pushing the carrier of the handling device on to the forward end of the injector so that the injector body is slidably received in the cylindrical sleeve, the boss carrying the needle hub is received in the bore of the bushing, and the sheath is coupled to the inner tube;
- pulling the carrier away from the cylindrical body of the injector with the sheath retained within the inner tube, the sleeve remaining on the injector body and the bushing remaining on the needle hub and boss, with the sleeve being urged forwardly by the spring to protect the needle;

and following the performance of an injection, during which the sleeve slides rearwardly over the injector body against the action of the spring to expose the needle as required:

- pushing the carrier once more on to the forward end of the injector so receiving the sleeve into the carrier and refitting the sheath on to the needle; and
- rotating the carrier to unthread the needle hub from the boss and freeing the carrier from the injector body with the needle and sheath carried therewithin, for disposal.